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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/099,906

03/14/2002

John H. Oates

0102323-00092

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12/21/2005

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EXAMINER

TORRES, JUAN A

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/099,906	Applicant(s) OATES, JOHN H.	
	Examiner Juan A. Torres	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-14, 17, 18, 20-26 and 28 is/are rejected.
- 7) ☒ Claim(s) 7, 15, 16, 19, 27 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Oath/Declaration***

A copy of Declaration and Power of Attorney form has been received.

### ***Drawings***

The modifications to the drawings were received on 11/28/2005. These modifications are accepted by the Examiner. One of the previous objections has not been corrected.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description Figure 3 reference 118 see page 21 line 34 (clean version).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The modifications to the specification were received on 11/28/2005. These modifications are accepted by the Examiner.

In view of the amendment filed on 11/28/2005, the Examiner withdraws the specification objections of the previous Office action.

### ***Claim Objections***

In view of the amendment filed on 11/28/2005, the Examiner withdraws the claim objections to claims 1-11 of the previous Office action.

Claim 15 objected to because of the following informalities: in line 7 of claim 15 the recitation "g[t] g[r]" is improper; it is suggested to be changed to "g[r]". (It seems that the line to delete g[t] has been printed between  $r^{(n)}$  [t] and  $p^{(n)}$  [t-r] ). Appropriate correction is required.

Claim 29 objected to because of the following informalities: in line 9 of claim 29 the recitation " $a_{kp}^{(n)}$  [t]  $a_{kp}^{(n)H}$  [t]" is improper; it is suggested to be changed to " $a_{kp}^{(n)H}$  [t]". (It seems that the line to delete  $a_{kp}^{(n)}$  [t] has been printed between "wherein" and y). Appropriate correction is required.

Claim 29 objected to because of the following informalities: in line 14 of claim 29 the deletion of the recitation " $\tau_{kp}^{(n)}$ " is improper; it is suggested not to delete it. Appropriate correction is required.

Claim 29 objected to because of the following informalities: in line 17 of claim 29 the recitation " $c_{km}$  [r]  $c_{km}^*$  [r]" is improper; it is suggested to be changed to " $c_{km}^*$  [r]". (It seems that the line to delete  $c_{km}$  [r] has been printed in  $\tau_{kp}^{(n)}$ , see above). Appropriate correction is required.

Claim 29 objected to because of the following informalities: in lines 17-19 of claim 29 the recitation " $c_{km}^*$  [r] represents a user code comprising at least a scrambling code, an orthogonal variable spreading factor code, and a j factor associated with even numbered dedicated physical channels." is improper; it is suggested to be changed to " $c_{km}^*$  [r] represents **the complex conjugate of** a user code comprising at least a scrambling code, an orthogonal variable spreading factor code, and a j factor associated with even numbered dedicated physical channels". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The modifications to the claims were received on 11/28/2005. These modifications are accepted by the Examiner.

In view of the amendment filed on 11/28/2005, the Examiner withdraws the claims rejections under 35 USC 112 second paragraph to claim 29 of the previous Office action.

### ***Response to Arguments***

Applicant's arguments filed on 11/09/2005 have been fully considered but they are not persuasive.

#### **Regarding claims 1, 11 and 22:**

The Applicant contends, "Kim does not teach or disclose either the interference signal regenerated by the interference regeneration devices or the receiving signal transmitted through the delay unit as being a composite spread-spectrum waveform or an estimated composite spread-spectrum waveform, as claimed by the Applicant. It is

unclear how the receiving signal in Kim can be considered to be an estimate of the interference signal or how the interference signal can be considered to be an estimate of the receiving signal. If the rejection of claims 1, 11, and 22 is to be maintained, the Applicant respectfully requests that it be pointed out with particularity where Kim teaches one signal as being an estimate of the other."

The Examiner disagrees and asserts, that, as indicated in the previous Office action, Kim a composite spread-spectrum waveform (this will be the received signal after the delay in figure 1 that is input block 201, it is a composite signal because in this signal is the desired signal plus interference) and an estimated composite spread-spectrum waveform (figure 1 block 240, this is the input to the block "ADDING ELEMENT" that receives the composite spread-spectrum waveform at the input of block 201 as a positive and all the interferences from all the other users as a negative value).

The Applicant contends, "Kim does not teach or disclose generating a residual composite spread-spectrum waveform as a function of an arithmetic difference between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform as claimed by the Applicant."

The Examiner disagrees and asserts, that, as indicated in the previous Office action, (figure 1 block 240, block "ADDING ELEMENT" receives the composite spread-spectrum waveform at the input of block 201 as a positive (+) and all the interferences from all the other users as a negative (-) value, so this block computes the arithmetic difference between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform as claimed by the Applicant.)

For these reasons and the reasons indicated in the previous Office Action the rejections of claims 1, 11 and 22 are maintained.

Regarding claims 4, 9, 14 and 28:

The Applicant contends, "because claims 4 and 9 depend from allowable claim 1, claim 14 depends from allowable claim 11, and claim 28 depends from allowable claim 22, these rejections are moot and the claims should be allowed to issue".

The Examiner disagrees and asserts, that, as indicated in the previous Office action, because the rejection of claims 1, 11 and 22 are maintained, the rejections of claims 4, 9, 14 and 28 are also maintained.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5, 6, 8, 10-13, 17, 18 and 20-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim (US 6570864 B1).

As per claim 1 Kim discloses a spread spectrum communication system of the type that processes one or more spread-spectrum waveforms, each representative of a waveform associated with a respective user, comprising a first logic element that generates a residual composite spread-spectrum waveform as a function of an

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arithmetical difference between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform (figure 1 block 240 output of block "adding element" column 2 line 51 to column 3 line 40), one or more second logic elements each coupled to the first logic element, each second logic element generating a refined matched-filter detection statistic for at least a selected user (figure 1 block 20N column 2 line 36 to column 3 line 43) as a function of the residual composite spread-spectrum waveform (figure 1 block 261 column 2 line 36 to column 3 line 43) and a characteristic of an estimate of the selected user's spread-spectrum waveform (figure 1 block 231 column 2 line 36 to column 3 line 43).

As per claim 2 Kim discloses claim 1. Kim also discloses that the characteristic is at least one of an estimated amplitude and an estimated symbol associated with the estimate of the selected user's spread-spectrum waveform (figure 2A column 3 line 59 column 4 line 16).

As per claim 3 Kim discloses claim 1. Kim also discloses that the spread-spectrum communications system comprises a code division multiple access (CDMA) base station (column 1 lines 8-14).

As per claim 5 Kim discloses claim 1. Kim also discloses that the first logic element comprises summation logic which generates the residual composite spread-spectrum waveform based on the relation  $r_{res}^{(n)}[t] = r[t] - \hat{r}^{(n)}[t]$  (figures 1 and 2D; column 2 line 36 to column 3 line 43 and column 6 line 49 to column 7 line 25).

As per claim 6 Kim discloses claim 5. Kim also discloses that the composite spread-spectrum waveform is pulse-shaped and is based on estimated complex



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amplitudes, estimated delay lags, estimated symbols, and codes of the one or more user spread-spectrum waveforms (figure 1 block 252 column 2 line 36 to column 3 line 43).

As per claim 8 Kim discloses claim 1. Kim also discloses that the refined matched-filter detection statistic for each user is iteratively generated (figure 2D column 6 line 49 to column 7 line 25).

As per claim 10 Kim discloses claim 1. Kim also discloses that the first and second logic elements are implemented on any of processors, field programmable gate arrays, array processors and co-processors, or any combination thereof (column 5 lines 5-11).

As per claim 11 Kim discloses a spread spectrum communication system of the type that processes one or more user spread-spectrum waveforms, each representative of a waveform associated with a respective user, the improvement comprising a first logic element which generates an estimated composite spread-spectrum waveform that is a function of estimated user complex channel amplitudes, time lags, and user codes (figure 1 block 240 output of block "adding element" column 2 line 51 to column 3 line 40), a second logic element coupled to the first logic element, the second logic element generating a residual composite spread-spectrum waveform as a function of an arithmetical difference between a composite user spread-spectrum waveform and the estimated composite spread-spectrum waveform (figure 1 block 240 column 2 line 51 to column 3 line 40), one or more third logic elements each coupled to the second logic element, the third logic element generating a refined matched-filter detection statistic for

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at least a selected user (figure 1 block 20N column 2 line 36 to column 3 line 43) as a function of the residual composite spread-spectrum waveform (figure 1 block 261 column 2 line 36 to column 3 line 43) and a characteristic of an estimate of the selected user's spread-spectrum waveform (figure 1 block 231 column 2 line 36 to column 3 line 43).

As per claim 12 Kim discloses claim 11. Kim also discloses that the characteristic is at least one of an estimated amplitude, an estimated delay lag and an estimated symbol associated with the estimate of the selected user's spread-spectrum waveform (figure 2A column 3 line 59 column 4 line 16).

As per claim 13 Kim discloses claim 11. Kim also discloses that the spread-spectrum communications system comprises a code division multiple access (CDMA) base station (column 1 lines 8-14).

As per claim 17 Kim discloses claim 11. Kim also discloses that the second logic element comprises summation logic which generates the residual composite spread-spectrum waveform based on the relation  $r_{res}^{(n)}[t] = r[t] - \hat{r}^{(n)}[t]$  (figures 1 and 2D; column 2 line 36 to column 3 line 43 and column 6 line 49 to column 7 line 25).

As per claim 18 Kim discloses claim 17. Kim also discloses that the composite spread-spectrum waveform is pulse-shaped and is based user spread-spectrum waveforms (figure 1 block 252 column 2 line 36 to column 3 line 43).

As per claim 20 Kim discloses claim 11. Kim also discloses that the refined matched-filter detection statistic for each user is iteratively generated (figure 2D column 6 line 49 to column 7 line 25).

As per claim 21 Kim discloses claim 11. Kim also discloses that the first and second logic elements are implemented on any of processors, field programmable gate arrays, array processors and co-processors, or any combination thereof (column 5 lines 5-11).

As per claim 22 Kim discloses a method for generating a residual composite spread-spectrum waveform as a function of an arithmetic difference between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform (figure 1 block 240 output of block "adding element" column 2 line 51 to column 3 line 40), generating a refined matched-filter detection statistic that is a function of a sum of a rake-processed residual composite spread-spectrum waveform for a selected user and an amplitude statistic for that selected user (figure 1 block 20N column 2 line 36 to column 3 line 43).

As per claim 23 Kim discloses claim 22. Kim also discloses generating a refined matched-filter detection statistic that is a function of a sum of a rake-processed residual composite spread-spectrum waveform for a selected user and an amplitude statistic for that selected user multiplied by a soft symbol estimate (figure 2A column 3 line 59 column 4 line 16).

As per claim 24 Kim discloses claim 22. Kim also discloses that the spread-spectrum communications system comprises a code division multiple access (CDMA) base station (column 1 lines 8-14).

As per claim 25 Kim discloses claim 22. Kim also discloses that the second logic element comprises summation logic which generates the residual composite spread-

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spectrum waveform based on the relation  $r_{res}^{(n)}[t] = r[t] - \hat{r}^{(n)}[t]$  (figures 1 and 2D; column 2 line 36 to column 3 line 43 and column 6 line 49 to column 7 line 25).

As per claim 26 Kim discloses claim 22. Kim also discloses that the estimated composite spread-spectrum waveform is pulse-shaped and is based on a composite user re-spread waveform (figure 1 block 252 column 2 line 36 to column 3 line 43).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 9, 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US 6570864 B1) as applied to claim 1 above, and further in view of Yoshida (US 6282233 B1).

As per claim 4 Kim discloses claim 1. Kim doesn't specifically disclose that the CDMA base station comprises one or more long-code receivers, and each long-code receiver generating one or more respective matched-filter detection statistics, from which the estimated composite spread-spectrum waveform. Yoshida discloses that the CDMA base station comprises one or more long-code receivers, and each long-code receiver generating one or more respective matched-filter detection statistics, from which the estimated composite spread-spectrum waveform (column 12 lines 31-38). Kim and Yoshida are analogous art because they are from the same field of endeavor.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the long codes disclosed by Yoshida in the decoding apparatus disclosed by Kim. The suggestion/motivation for doing so would have been to obtain spread code period longer than a symbol period (column 12 lines 31-38). Therefore, it would have been obvious to combine Kim and Yoshida to obtain the invention as specified in claim 4.

As per claim 9 Kim discloses claim 1. Kim doesn't specifically disclose that a long-code receiver generates the refined matched-filter detection statistic for at least a selected user. Yoshida discloses that a long-code receiver generates the refined matched-filter detection statistic for at least a selected user (column 12 lines 31-38). Kim and Yoshida are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the long codes disclosed by Yoshida in the decoding apparatus disclosed by Kim. The suggestion/motivation for doing so would have been to obtain spread code period longer than a symbol period (column 12 lines 31-38). Therefore, it would have been obvious to combine Kim and Yoshida to obtain the invention as specified in claim 9.

As per claim 14 Kim discloses claim 11. Kim doesn't specifically disclose that the CDMA base station comprises one or more long-code receivers. Yoshida discloses that the CDMA base station comprises one or more long-code receivers (column 12 lines 31-38). Kim and Yoshida are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of

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ordinary skill in the art to incorporate the long codes disclosed by Yoshida in the decoding apparatus disclosed by Kim. The suggestion/motivation for doing so would have been to obtain spread code period longer than a symbol period (column 12 lines 31-38). Therefore, it would have been obvious to combine Kim and Yoshida to obtain the invention as specified in claim 4.

As per claim 28 Kim discloses claim 22. Kim doesn't specifically disclose that a long-code receiver generates the refined matched-filter detection statistic. Yoshida discloses that a long-code receiver generates the refined matched-filter detection statistic (column 12 lines 31-38). Kim and Yoshida are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the long codes disclosed by Yoshida in the decoding apparatus disclosed by Kim. The suggestion/motivation for doing so would have been to obtain spread code period longer than a symbol period (column 12 lines 31-38). Therefore, it would have been obvious to combine Kim and Yoshida to obtain the invention as specified in claim 9.

***Allowable Subject Matter***

Claims 7, 15, 16, 19, 27 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: claims 7, 15, 16, 19, 27 and 29 are allowed because the references cited fail to teach, as applicant has, the equations presented in those claims, as the applicant has claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Juan Alberto Torres  
12-14-2005

  
**KEVIN BURD**  
**PRIMARY EXAMINER**